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OCCURRENCE OF GASTRO-INTESTINAL HELMINTHS OF PIGS SLAUGHTERED AT THE JOS ABATTOIR, PLATEAU STATE, NIGERIA

***[1]Gagman, H. A., [2]Ajayi, O. O. and [1]Abubakar, B. M.**
[1]Department of Biological Sciences, Bauchi State University Gadau, Bauchi Nigeria
[2]Department of Zoology, University of Jos, Nigeria
*Correspondence author

ABSTRACT
An investigation on the occurrence of gastro intestinal helminthes of pigs slaughtered at the Jos Abattoir was carried out between May and November 2007, to determined sex, age, and breed related rate of infection, and the possible risk factors to the spread of the epidemic, using direct smear and floatation techniques. Out of the total of 532 examined, 245 (46.10%) were positive for five species of helminthes parasites, namely Taenia solium 44(8.27%) Ascaris suum 52(9.77%), Trichuris suis 40(7.52%) Strongyloids ransomi 16(3.0%) Ascarops strongylina 28(5.26%). Of the 532 pigs sampled, 65(12.22%) were recorded with mixed infection. The parasites were more established in the female pigs 149(50%) than in the male pigs 96(41.02%) However, chi square analysis showed no significant difference in the prevalence rate between female and male pigs (p>0.05). Apparently adult pigs haboured more of the helminthes parasites 240(57.14%) than the young pigs 41(36.61%) although the difference was not statistically significance. The large white breed was infected most, among the various breeds 239(48.28%). The infection rate for the large black was 2(26.67%) and for the mixed breed was 4(20.00%). There was no significant difference in the infection rate among the various breed of pigs (p>0.05). The study shows that breeds and sex are not the promoting factors to infection rate but age.
Keywords: Endemicity, Gastro-intestinal, Helminths, Occurrence, Pigs.

INTRODUCTION

A parasite is an organism that has sustained contact with another organism to the detriment of the host organism, Weng, *et al,* (2005). A parasite can also be define as any living organism (plant or animal) which lives inside or on the surface of another organism (the host) and from which it gains it food supply and other means of lively hood Henderson, (1990). Brander, (1982) reported that most parasites of intestinal worms are classified as cestodes (Tap worms), Trematode (flukes) nematodes (round worms) and protozoans.

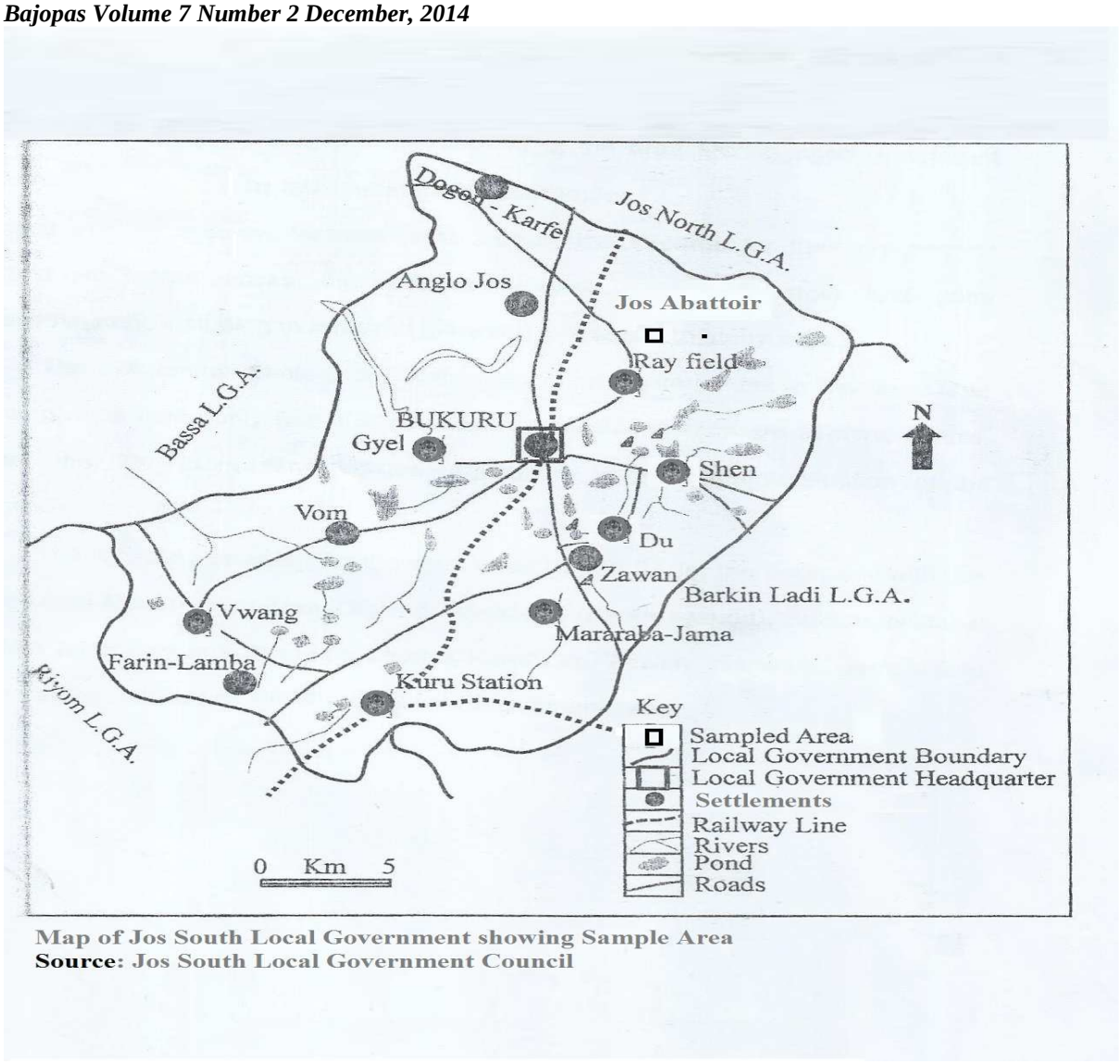
Parasites of pig cause major economic loss globally as a consequence of reduced feed conversion and weigh gains and the condemnation of affected organs found after slaughtered Boes *et al.* (2000), Joaching *et al*. (2001). Pigs are infected with gastro-intestinal parasite through oral ingestion of helminthes eggs or cysts from pigs environment. Once ingested, the parasite competes with infected pig for nutrient, and the pig that are heavily infected grow slower, and become less resistant to disease and stress Weng, *et al,* (2005). In some cases, internal organs are damaged due to internal parasite which may result in condemnation of such organs as meat by meat inspector. This often led to great nutritional and economic loss Harper, (2004).

Ajayi *et al*. (1988) carried out a survey on the prevalence of helminthes and protozoans of pigs in Jos Plateau and recorded the following parasites. *Ascaris suum* 1029(90.4%), *Oesophagastumum dentatum* 798(70.0%), *Metastrogylus salmi* 749(65.7%), *Ascarops strongylina* 726(63.7%), *Stongyloide ransomi* 626(54.9%). Fabayi *et al*. (1979), reported that *Oesophagostumum dentatum, Oesephagostumum guadrispinulatum, Metastrongyloide salmi, Ascropsstrongylina,* and *Trichuris suis* were common in all age groups. *Ascaris suum* was very common in store pig and fairly common in other age groups. *Trichuris suis* was common in store pigs but not frequently encountered in other groups. *Stephanurus denitatus, Physocephalus sexalatus, and Hyustrongylus rubidus* were fairly common in adult pigs and less in other age groups *Globacephalus Urosubulatus* was common in all age groups. This research was carried out with the objectives of determining the sex, age, and breed related rate of infection with gastro-intestinal helminths of pigs and also to determine the possible risk factors to the spread of the epidemic.

MATERIALS AND METHODS

Sampling Site

Samples were collected from pigs brought for slaughter at Jos Abattoir. Jos Abattoir is located in Jos South Local Government Area of Plateau State. Jos South Local Government Area is located south of Jos North between longitude 8^0 48'W and latitude 9^0 94'N., in North Central Geo-political Zone of Nigeria. The headquarters is at Bukuru, which is about 15 kilometers from Jos town, the capital of Plateau State. The area is about 1,250 metres above sea level. The abattoir is a processing unit for pork hence provides job opportunity for butchers and markets for farmers (Animal breeders).



Map of Jos South Local Government showing Sample Area
Source: Jos South Local Government Council

Figure 1: Map of Jos South Local Government Area indicating the location of the abattoir

Faecal Samples Collection

Faecal samples were collected base on sex, age and breeds of pigs brought for slaughter at the Jos Abattoir. Sample was collected from each pig by inserting a hand with hand glove into the rectum through the anus. About 5g of the sample from each pig was immediately transferred in to screw cap specimen bottles with the label sex, age and breed of pig and were transferred to the laboratory for analysis and examination.

Analysis and Examination of Faecal Samples

- **Floatation Technique:-**
  This was demostrated by Soulsby (1986), Sargent *et al* (1998), Cheesbrough (2000). About 3g of faecal material was emulsified in 30ml of distilled water in a beaker and was filtered through sieves with mesh of 30, 60, and 90mm. The strained material was immediately transferred into centrifuge tubes and centrifuged at 1,5000 revolutions per minute (RPM) for 5 minutes. The clear supernatant in each tube was discarded and sugar solution of specific gravity (S. G 1.2) was added to the sediment in each centrifuge tube until a convex meniscus was formed. Each tube was then covered with a glass cover slip and allowed to stand for 10 minutes. Each cover slip was then gently lifted from each tube and placed on a clean grease-free glass slide and examined under the x 10 and x 40 objectives of the microscope for the presence of eggs of helminths parasite.
- **Direct Smear Method**

This method was demonstrated by Soulsby (1986) and Cheesbrough (2000) A small quantity of the faecal sample was placed on the clean grease-free glass slide with a glass rod and a smear is made. A drop of 1% normal saline was added and thoroughly mixed. The slide was covered with a glass cover slip and examined under microscope for the present of egg of helminths parasites. The eggs of helmenths were identified using keys adopted by Chandler *et al* (1961), Cheesbrugh (2000).

Statistical Analysis

A Pearson's chi-square test was used to test a correlation between occurrence of helminthes parasites and age, sex and breeds of pigs.

RESULTS

The overall occurrence rate of gastro-intestinal helminthes of pigs slaughtered at the Jos Abattoir is showed in Table 1. Out of the 532 pigs examined 245(46.10%) were positive for different species of helminthes parasites. The component of the gastro-intestinal parasites recorded in this studies was Ascaris suum 52(9.77%) followed by *Taenia soluim* 44(8.27%), *Trichuris suis* 40(7.52%), *Ascarops strongylina* 28(5.28%) and the least of 16(3.0%) was *Strongyloid ransomi.* 65(12.22%) of the pigs examined haboured mixed infection of at least two species of the helminthes parasites recorded in this research.

Table 2 showed sex related rate of infection with gastro-intestinal helminthes of pigs slaughtered at the Jos Abattoir. The parasites were established more in female pigs 149(50.0%) than in the male pigs 96(41.02%), statistically there was no significant difference in the infection rate between male and female pigs (p0.05). The age distribution of gastro-intestinal helminthes infection among the pigs was shown in Table 3. The rate of infection was recorded more in the adult pigs 240(57.14%) than in the young pigs 41(36.61%). The rate of infection by helminthes among the adult pigs was *Ascaris suum,* 12.3%, *Taenia solium* 10.48%, *Trichuris suis* 9.52%, *Ascarops strongylina* 6.67% and *Strongyloid ransomi* 3.81%. The rate of infection among the young pigs were 8.93% for *T. solium,* 7.14%, *A. suum,* 6.25% *T. suis* and 2.68% *S. ransomi* respectively. Chi-square analysis showed that there was significant different in the infection rate between adult and young ($p<0.05$).

The breeds related rate of infection with gastro-intestinal helminthes among the pigs is presented in Table 4. The highest rate of infection 48.28% was recorded among the large white. The incident rate of 26.67% and 20% was recorded among the large black and mixed breeds respectively. However these differences were statistically insignificance ($p>0.05$).

Table 1: Overall rate of infection with gastro-intestinal helminthes parasites of pigs slaughtered at the Jos, Abattoir

S/N	Parasite	No. of pig examined	No infected	Percentage
1	*T. solium*	532	44	8.27
2	*A. suum*	532	52	9.77
3	*T. suis*	532	40	7.52
4	*S. ransomi*	532	16	3.00
5	*A. strongylina*	532	28	5.26
6	Mixed infection	532	65	12.22
7	Total	532	245	46.10

Table 2: Sex related rate of infection with gastro-intestinal helminthes of pigs slaughtered at the Jos Abattoir

Parasite type		*T. solium*	*A. suum*	*T. suis*	*S. ransomi*	*A. strongylina*	Mixed infection	
Sex of pigs	***No of Pig Examined***	**No infected (%)**	**No infected (%)**	**No infected (%)**	**No infected (%)**	**No infected (%)**	**No infected (%)**	**Total infected (%)**
Sows	298	27(9.10)	38(12.75)	20(6.7)	10(3.35)	14(4.70)	40(13.42)	149(50.00)
Hog/boars	234	17(7.26)	14(5.98)	20(8.55)	6(2.56)	14(5.98)	25(10.68)	96(41.02)

Table 3. Age related rate of infection with gastro-intestinal helminthes of pigs slaughtered at Jos Abattoir.

Parasite type		*T. solium*	*A. suum*	*T. suis*	*S. ransomi*	*A. strongylina*	Mixed infection	
Age of pigs	***No of Pig Examined***	**No infected (%)**	**No infected (%)**	**No infected (%)**	**No infected (%)**	**No infected (%)**	**No infected (%)**	**Total infected (%)**
Piglet (young)	112	10(8.93)	8(7.14)	7(6.25)	3(2.68)	8(7.14)	5(4.46)	41(36.61)
Adult	420	44(10.48)	52(12.38)	40(9.52)	16(3.81)	28(6.67)	60(14.29)	240(57.14)

Table 4: Breeds related rate of infection with gastro-intestinal helminthes of pigs slaughtered at Jos Abatoir

Parasite type		*T. solium*	*A. suum*	*T. suis*	*S. ransomi*	*A. strongylina*	Mixed infection	
Breed	***No of Pig Examined***	**No infected (%)**	**No infected (%)**	**No infected (%)**	**No infected (%)**	**No infected (%)**	**No infected (%)**	**Total infected (%)**
Large white	475	41(8.28)	52(10.51)	40(8.00)	17(3.43)	26(5.25)	63(12.72)	239(48.28)
Large black	15	1(6.67)	0(0.00)	0(0.00)	0(0.00)	1(6.67)	0(0.00)	2(26.67)
Mixed breed	20	2(10.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	2(0.00)	4(20.00)

DISCUSSION

In these findings, 46.10% of the animals were infected with five species of gastro-intestinal helminthes parasites. The work of Fabiyi (1979) and Ajayi *et al*. (1988), had similar findings which can suggest that these parasites are prevalent. Eggs of the following helminthes parasites *Taenia solium Ascaris suum Tricuris suis Strongyloides ransomi and Ascarops strongylina* reported in this study were also reported in similar studies carried out by Fabiyi (1979), Ajayi *et al* (1988), Boes *et al* (2000), However, *Osophagostomum dentatum, Metastrongyloides salmi, Stephanurus dentatus, Hyustrongylus rubidus, Physocephalus sexalatus Osephagostomum quadrispinulatus, Cysticercus cellulosae* recorded by Fabiyi (1979), Ajayi *et al* (1988) were not recorded in this study. The low infection rate and low varieties of parasite could be due to improvement in veterinary medical care by the local farmers, improve sanitary condition of feeding, pigs pen house and its surrounding. This could also be attributed to the fact that this study was restricted to the examination of faecal sample where as Fabiyi (1979) recorded juvenile and adult worms at necropsy. Furthermore the faecal analysis method cannot isolate eggs of parasite which do not inhabit gastro-intestinal tract. In addition, the fewer number of sample 532 as compare to higher number of sample 1144 collected by Ajayi *et al* (1988) may account for the reason for few species of helminthes recorded as compared to higher number of species in the previous studies by Ajayi *et al* (1988). Chi-square analysis showed no significant different in the rate of infection in term of sex, and breeds. Therefore the contaminations of the environment become the determining factor for infection rate since both sexes and all breeds are infected at similar rate.

However, there was significant difference in the rate of infection between the young and the adult pigs (p0.05) this may be due to the fact that adult pigs have been exposed to garbages for long. The young pigs that are still sucking breast or newly wean have more immunity to parasitic infection than adult.

The low infection rate in young pigs as compared to high infection rate in the adult pigs recorded in this investigation agreed with recent studies carried out by Urquhart *et al*. (2003).The mixed infection of helminthes observed within some pigs in this study is suggesting that, they could be suffering from parasitic gastroenteritics (PGE) complex Chiejina, (1987).

CONCLUSION

It could be concluded from the findings that gastro-intestinal helminthes are endemic in pigs within Jos and it environs. The high rate of infection with helminthes parasite may not be unconnected with the types of pigs husbandry system where pigs are allowed to roam within the environment and exercise their coprophagous mode of feeding (feeding on wide varieties of gabages). Also sex and breeds are not factors influencing the prevalent rate of infection but environment. However, age is a factor that influence rate of infection with helminthes parasites simply because young pigs, especially sucking type undergoes less coprophagous mode of feeding than the adult pigs. This findings should be of help to veterinarians and health workers in the Jos Abattoir as they should certifying that only healthy pigs examined are slaughtered. Also pork eaters are advice to prepare the pork thoroughly to get rid of the parasites (adults, eggs, cysts) before eating. The finding will also help the farmers in organizing a befitting animal husbandry system, maintenance of proper feeding and sanitary conditions, deworming, towards maximum productivity.

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